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INSTRUCTION MANUAL

HDE-2H/C-QAM

HDMI/Component ENCODER QAM

Model	Stock No.	Description
HDE-2H-QAM	6375	2x HDMI/Component-to-QAM Encoder
HDE-2C-QAM	6377	2x Component-to-QAM Encoder

Status	Date	Document No.	Issue No.	Author
Active	August 12, 2010	651224900B	2	AB
Obsolete	May 11, 2010	651224900A	1	JZ/AB

MADE IN USA

We recommend that you write the following information in the spaces provided below.

Purchase Location Name:	
Purchase Location Telephone Number:	
HDE-2H/C-QAM Serial Number:	

The information contained herein is subject to change without notice. Revisions may be issued to advise of such changes and/or additions.

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Blonder Tongue Laboratories, Inc.

One Jake Brown Road

Old Bridge, NJ 08857

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Section 1 — General & Safety Instructions

The STOP sign symbol is intended to alert you to the presence of REQUIRED operating and maintenance (servicing) instructions that if not followed, may result in product failure or destruction.

The YIELD sign symbol is intended to alert you to the presence of RECOMMENDED operating and maintenance (servicing) instructions.

The LIGHTNING flash symbol is intended to alert you to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electrical shock.

TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT REMOVE COVER FROM THIS UNIT.
NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE

NOTE TO CATV SYSTEM INSTALLER

This reminder is provided to call the CATV System Installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

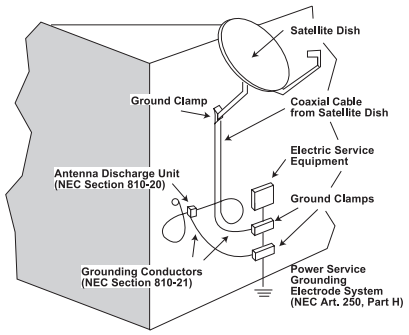
Safety Instructions

YOU SHOULD ALWAYS FOLLOW THESE INSTRUCTIONS TO HELP ENSURE AGAINST INJURY TO YOURSELF AND DAMAGE TO YOUR EQUIPMENT.

- Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature per Section 2.3.
- Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).
- Read all safety and operating instructions before you operate the unit.
- Retain all safety and operating instructions for future reference.
- Heed all warnings on the unit and in the safety and operating instructions.

Safety Instructions - continued

- Follow all installation, operating, and use instructions.
- Unplug the unit from the AC power outlet before cleaning. Use only a damp cloth for cleaning the exterior of the unit.
- Do not use accessories or attachments not recommended by Blonder Tongue, as they may cause hazards, and will void the warranty.
- Do not operate the unit in high-humidity areas, or expose it to water or moisture.
- Do not place the unit on an unstable cart, stand, tripod, bracket, or table. The unit may fall, causing serious personal injury and damage to the unit. Install the unit only in a mounting rack designed for 19" rack-mounted equipment.
- Do not block or cover slots and openings in the unit. These are provided for ventilation and protection from overheating. Never place the unit near or over a radiator or heat register. Do not place the unit in an enclosure such as a cabinet without proper ventilation. Do not mount equipment in the rack space directly above or below the unit.
- Operate the unit using only the type of power source indicated on the marking label. Unplug the unit power cord by gripping the plug, not the cord.
- The unit is equipped with a three-wire ground-type plug. This plug will fit only into a ground-type power outlet. If you are unable to insert the plug into the outlet, contact an electrician to replace the outlet. Do not defeat the safety purpose of the ground-type plug.
- Route power supply cords so that they are not likely to be walked on or pinched by items placed upon or against them. Pay particular attention to cords at plugs, convenience receptacles, and the point where they exit from the unit.
- Be sure that the outdoor components of the antenna system are grounded in accordance with local, federal, and National Electrical Code (NEC) requirements. Pay special attention to NEC Sections 810 and 820. See the example shown in the following diagram:



- We strongly recommend using an outlet that contains surge suppression or ground fault protection. For added protection during a lightning storm, or when the unit is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the lines between the unit and the antenna. This will prevent damage caused by lightning or power line surges.
- Do not locate the antenna near overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing the antenna, take extreme care to avoid touching such power lines or circuits, as contact with them can be fatal.
- Do not overload wall outlets or extension cords, as this can result in a risk of fire or electrical shock.
- Never insert objects of any kind into the unit through openings, as the objects may touch dangerous voltage points or short out parts. This could cause fire or electrical shock.
- Do not attempt to service the unit yourself, as opening or removing covers may expose you to dangerous voltage and will void the warranty. Refer all servicing to authorized service personnel.
- Unplug the unit from the wall outlet and refer servicing to authorized service personnel whenever the following occurs:
  - ❑ The power supply cord or plug is damaged;
  - ❑ Liquid has been spilled, or objects have fallen into the unit;
  - ❑ The unit has been exposed to rain or water;
  - ❑ The unit has been dropped or the chassis has been damaged;
  - ❑ The unit exhibits a distinct change in performance.
- When replacement parts are required, ensure that the service technician uses replacement parts specified by Blonder Tongue. Unauthorized substitutions may damage the unit or cause electrical shock or fire, and will void the warranty.
- Upon completion of any service or repair to the unit, ask the service technician to perform safety checks to ensure that the unit is in proper operating condition.

Returning Product for Repair (or Credit)

A Return Material Authorization (RMA) Number is required on all products returned to Blonder Tongue, regardless if the product is being returned for repair or credit. Before returning product, please contact the Blonder Tongue Service Department at 1-800-523-6049, Ext. 4256 or visit our website: **www.blondertongue.com** for further information.

Section 2 — Product Summary

2.1 Revision History & Reason

This is the second issue of the Instruction Manual.

The reason for this revision was to correct the AC input voltage requirements.

2.2 Product Application & Description

Application:

HDE-2H-QAM (HD Encoder – 2xHDMI/YPbPr – QAM) accepts & auto-detects up to two (2) input streams in unencrypted HDMI & YPbPr (Component) formats. The encoder, when applicable, digitizes & MPEG-2 encodes each input into a high-definition stream (HD-1080i/720p), and then multiplexes the resulting two (2) streams into one (1) output in QAM format in the 5.75-864 MHz range (CATV channels T7-T14 and 2-135). Any combination of input multiplexing is allowed, for example, 2x HDMI, or (1xHDMI)+(1xYPbPr).

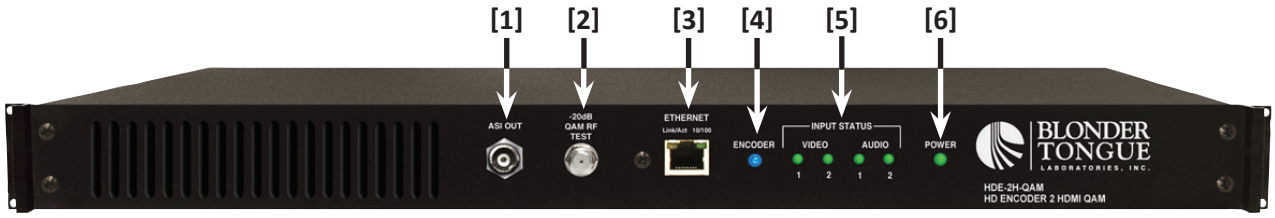
The encoder supports Dolby Digital AC-3 encoding & Closed Captioning, and is equipped with an EAS (Emergency Alert System) interface & an ancillary ASI output port. A front-panel RF test point allows for monitoring/testing of the QAM output without service interruption.

Comprehensive remote monitoring and control is accomplished using any standard Web browser via a front-panel 10/100BaseT Ethernet connection.

HDE-2C-QAM is identical to HDE-2H-QAM, but it does not support the HDMI input. It accepts only two (2) inputs in YPbPr (Component) format.

Description:

Below are the front and rear pictures of the unit:



[1] ASI OUT:
This BNC output connector contains both multiplexed input programs in ASI format (DVB-ASI; 50083-9; 270 Mbps) and is typically used as input to an external modulator.

[2] QAM RF TEST:
"F" connector for RF testing @ 20dB below the main output.

[3] ETHERNET:
RJ45 connector for 10/100 Ethernet interface used to monitor and configure the unit.

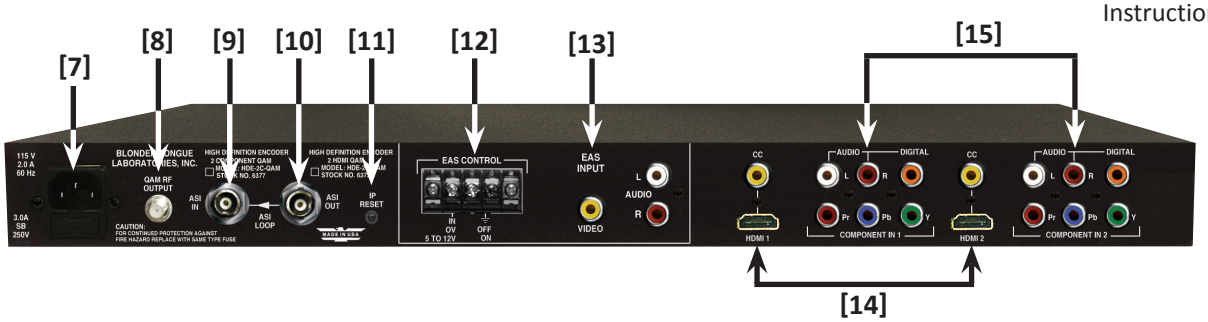
[4] ENCODER:
LED indicates the status of the two internal encoder chipsets as follows:

LED is Blue = The two encoder chipset are encoding (no input signal needs to be present).
LED is off = One or both of the of the encoder chipsets is not encoding, or the normal operation temperate of one or both of the chipsets is exceeded.

[5] INPUT STATUS:
LEDs indicate the status of video and audio of each of the two inputs as follows:

Video LED is Green = Input type is Component (YPbPr) and it is being encoded successfully
Video LED is Amber = Input type is HDMI and it is being encoded successfully
Video LED is off = Input is not present, or input is present, it is not being encoded
Video LED is Red = Error condition
Audio LED is Green = Audio is detected and received
Audio LED is Red = Audio is not detected (has a delay of an approximately 1.5 seconds), or audio is not present

[6] POWER:
LED is off = No AC power is detected
LED is Green = AC power is detected



[7] INPUT POWER ASSEMBLY: IEC 14 power inlet plug - rated 115 VAC; 2.0 A; 60 Hz; equipped with Slo-Blo, 3.0 Amps, 250 V Fuse.

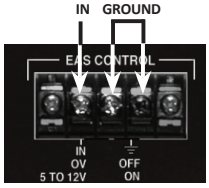
STOP

THIS UNIT IS RATED FOR 115VAC ONLY. YOU MUST SEND THE UNIT BACK TO BLONDER TONGUE TO BE RE-FITTED FOR 220VAC APPLICATIONS.

[8] QAM RF OUT: "F" connector for single RF QAM output – typically the input source is [9] below. The QAM module is agile from 5.75 to 864 MHz (Sub-band channels T7 to T14 and standard CATV channels 2 to 135) with an output level of +60 dBmV.
[9] ASI IN: This BNC connector is utilized as the ASI input to the unit's internal ASI-to-QAM modulator. The ASI input is typically provided by [10] below.
[10] ASI OUT: This BNC output connector contains the two multiplexed input programs in ASI format (DVB-ASI; 50083-9; 270 Mbps) and is typically looped-back in to the "ASI IN" connector [9] above using the BNC-to-BNC jumper cable included in the hardware bag that comes with the unit.
[11] IP RESET: When pushed and held for about 10 seconds, resets the IP address, Usernames, and Passwords to Factory default values as follows:

IP address = 172.16.70.1
Username = Admin (case-sensitive)
Password = pass (case-sensitive)

[12] EAS CONTROL: EAS (Emergency Alert System) is triggered "ON" when 5 to 12 volt is presented between terminal contact marked "IN" and the two terminal contacts marked "Ground" shown below (EAS will not trigger unless EAS video is present).



[13] EAS INPUT: When EAS Control contact [12] above is triggered "ON", the QAM RF OUT [8] above will contain the video and audio present at the corresponding RCA connectors of this EAS INPUT – i.e. input programs 1 and 2 (whether HDMI or Component) will be replaced with video/audio program present on this EAS INPUT when the EAS CONTROL contact is triggered ON.

EAS FEATURE IS FUNCTIONAL ONLY WHEN (I) EAS CONTROL IS TRIGGERED ON, AND (II) VIDEO/AUDIO IS DETECTED ON EAS INPUT CONNECTORS. THE EAS FEATURE WILL NOT BE FUNCTIONAL UNLESS BOTH THESE CONDITIONS ARE MET.

[14] HDMI 1 & 2 / CC (NOT APPLICALE TO HDE-2C-QAM MODEL)
The "HDMI 1" and "HDMI 2" connectors accept an unencrypted HDMI signal as input to the unit.
The RCA connector marked "CC" will accept analog NTSC Closed Captioning (EIA-608, also known as Line 21), which will then be digitized and inserted in the MPEG-2 Transport Stream of the HDMI input.

THE UNIT DOES NOT ACCEPT HDCP-ENCRYPTED HDMI INPUT.

[15] COMPONENT IN 1 & 2: The "COMPONET IN 1" and "COMPONET IN 2" accept analog component video (RCA connectors marked Pr, Pb, Y) and analog Left/Right audio (RCA connectors marked L and R) signal as input to the unit. Digital audio program is accepted via the RCA connector marked "DIGITAL".

2.3 Product Specification

Input

HDMI	**Not applicable for HDE-2C-QAM**
Connectors:	2x HDMI & 2x RCA (Closed Captioning)
Video Standard:	480i – 720x480 720p – Main profile I & P frames; 1280x720 1080i – Main profile I & P frames; 1920x1080
HDCP Encryption:	Not supported
Audio:	PCM and pass-through Dolby AC-3
YP_bP_r (Component)	
Connectors:	2 sets each 3x RCA for Video (Y, Pb, Pr) 2 sets each 2x RCA for Analog Audio (L, R) 2 sets each 1x RCA for Digital Audio
Video Standard:	Analog NTSC
Video Aspect Ratio:	16:9 & 4:3
EAS (Emergency Alert System)	
Connectors:	3x RCA (Video, Audio L & R); Terminal Strip

Encoding Profile	
Video	
Output Format:	MPEG-2 HD MP@ML; ISO 13818-2
Chroma:	4:2:0 & 4:2:2
Resolution:	720x480; 1280x720; 1920x1080
Frame Rate:	29.97 fps (1080i); 59.97 fps (720p)
Aspect Ratio:	16:9, 4:3
GOP Structure:	I & P frames (user-selectable)
Transport Rate:	Variable, user-selectable
Video Rate:	Variable, user-selectable
Video Pre-filter:	Variable, user-selectable
Intra DC Precision:	Variable, user-selectable from 8- to 11-bit
Color Space:	YCbCr
Audio	
Output Format:	Dolby Digital AC-3
Sampling rate:	48 KHz
Bit rate:	128-320 Kbps
Closed Captioning:	EIA-608 supported

Output

QAM	
Connectors	
Primary:	"F" Female
RF Test Port:	"F" Female (@ 20 dB below Primary output)
QAM Modulation Modes:	16, 32, 64, 128, 256, 512, & 1024
DVB Symbol Rate:	Variable; 1 to 7 MSymbols/sec (MBaud)
Frequency Range:	5.75 to 864 MHz
QAM Tuning:	CATV channel numbers T7 to T14 & 2 to 135
RF Level:	+60 dBmV (120 dBµV)
RF Level Accuracy:	± 2 dB
RF Level Range:	50 to 60 dBmV adjustable
Frequency Tolerance:	± 0.5 kHz @ 77 °F (25 °C)
Frequency Stability:	± 5 kHz over 32 to 122 °F (0 to 50 °C)
Amplitude Flatness:	± 0.25 dB (over 6 MHz channel)
Phase Noise:	-98 dBc (@ 10 kHz)
Spurious:	-60 dBc
Broadband Noise:	-75 dBc (@ +60 dBmV output level, 4 MHz bandwidth)
Impedance:	75 Ω
Return Loss:	12 dB
Spectral Inversion:	Auto Recognition
Carrier Suppression:	55 dB
SNR:	Greater than 40 dB
MER:	Greater than 40 dB
I/Q Phase Error:	Less than 1 degree
I/Q Amplitude Imbalance:	Less than 1%
ASI	
Connector:	1x BNC (Front-panel) 2x BNC (Rear-panel loop)
Standard:	DVB-ASI: EN 50083-9
Transport Rate:	270 Mbps

General

Dimensions (W x D x H):	19.0 x 19.5 x 1.75 inches (483 x 496 x 44 mm)
Power:	115 VAC/60 Hz (Fuse: 3.0 amp, 250 VDC, Slo Blo)
Power Dissipation:	105 W (max)
Weight:	12 lbs (5.4 kg)
Operating Temperature:	32 to 122 °F (0 to 50 °C)
Storage Temperature:	-13 to 158 °F (-25 to 70 °C)
Operating Humidity:	0 to 95% RH @ 35 °C max, non-condensing
Storage Humidity:	0 to 95% RH @ 35 °C max, non-condensing

Alarms/Monitoring/Control

Local Monitoring:	4x Input Status LEDs (Video 1 & 2; Audio 1 & 2) 1x Encoder LED 1x Power LED (Green=On)
Local Control:	1x IP Reset button
Remote Monitoring/Control:	GUI-based menu via Web browser

Section 3 – Installation & Power-up

3.1 Unpacking

You will find the following items in the box:

- HDE-2H-QAM Encoder or HDE-2C-QAM Encoder (QTY=1)
- Power Cord with IEC C13 line socket and 3-pin Type B NEMA 5 plug (QTY=1)
- A hardware bag (item 741021300) containing the following:
  - Seven-foot cross-pinned (cross-over) RJ45 Ethernet cable (QTY=1)
  - BNC-to-BNC jumper cable (QTY=1)

3.2 Installation

The HDE-2H/C-QAM encoder is designed to be installed in a standard 19-inch (483 mm) rack (EIA 310-D, IEC 60297, and DIN 41494 SC48D).

To install the encoder, secure the unit's front panel to the rack by inserting four (4) machine screws, with cup washers, through the four (4) mounting holes in the front panel.

INSTALL THE BNC-TO-BNC JUMPER CABLE BETWEEN CONNECTORS [9] AND [10] DESCRIBED IN SECTION 2.2.

3.3 Power-up

To power up the unit, connect the line cord to a 110VAC outlet and turn the switch, located on the power inlet plug assembly, on. Please note that the power inlet plug is also equipped with a fuse-holder and fuse (SLO-BLO, 3.0 Amps, 250V).

The "POWER" LED on the front-panel will light green.

Section 4 – Configuring the IP Interface

Before you can remotely access the unit, you must configure the unit's IP address to conform with your existing IP network or LAN. To do so, follow these steps:

(1) Plug one end of the cross-pinned RJ45 Ethernet cable that was provided in the packaging in the Ethernet interface (located in the rear of the unit). Plug the other end of the cable to your computer.

(2) The factory default IP address of the unit is **172.16.70.1.** To be able to communicate with the unit, you must first change your computer's IP address. The following steps explain how to do this for a computer with Windows XP operating software:

(a) On your computer, open the "Control Panel"

(b) Double-click on "Network Connections"

(c) Right-click on the "Local Area Connection", and then click on the "properties".

(d) A dialog box entitled "Local Area Connection Properties" will appear. In this box, double-click on the "Internet Protocol (TCP/IP)".

(e) A dialog box entitled "Internet Protocol (TCP/IP) Properties" will appear. Select the "Use the following IP address" option and enter the following addresses:

IP address: 172.16.70.2

Subnet mask: 255.255.255.0

No need to enter a value for the Default Gateway.

Click OK to close the dialog box. Now your computer is ready to communicate with the unit.

Section 5 - Configuring the Unit

5.1 Accessing the Unit Via the Web Browser

You must complete the steps described in Section 4 before proceeding as follows:

(1) Open a web browser on your computer (Internet Explorer 7 or higher is recommended) and enter the following URL address **(http://172.16.70.1)**. The "Login Screen" (Figure 5-1) will appear.

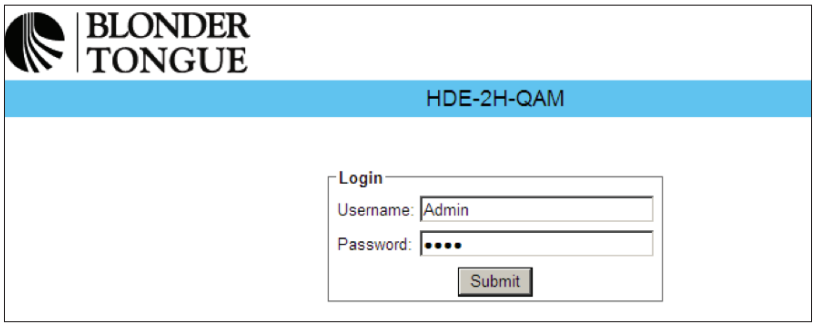


Figure 5-1: Login Screen

(2) Enter the following case-sensitive factory-default Username and Password, and click on the "Submit" button.

Username = Admin

Password = pass

5.2 Status Screen

After a successful login, the “Status Screen” (Figure 5-2) is displayed. The “Status Screen” provides a brief overview of the hardware/firmware version, internal operating temperatures, and the status/format of the video sources. The status page information can be updated by clicking the "Refresh" button.

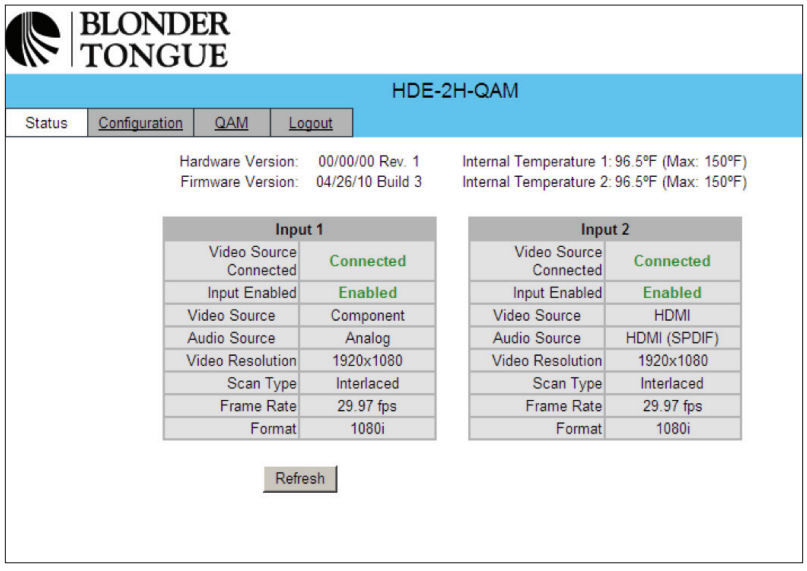


Figure 5-2: Status Screen

The following information is displayed on the “Status Screen” for each of the individual inputs:

Video Source Connected: Indicates if a video source is present at the HDMI or Component (YPbPr) inputs.

Input Enabled: Indicates if input is enabled or disabled. This value can be changed through the “Configuration > Video Screen” – See Section 5.3.1 for details.

Video Source: Indicates the type of video source connected (HDMI or Component).

Audio Source: Indicates the type of Audio source connected (Analog, HDMI (SPDF) or Digital).

Video Resolution: Indicates the video source resolution of the input signal – for example 1920x1080.

Scan Type: Indicates the scan type of the input video – for example, interlace.

Frame Rate: Indicates the Frame Rate of the input video – for example 29.97 Mbps.

Format: Indicates the Video format of the input video - for example 1080i.

5.3 Configuration Screen

The Configuration menu consists of seven tabs: Mode, Video, Transport, PSIP, Audio, Network and Date/Time. Each tab allows you to change related encoder configurations.

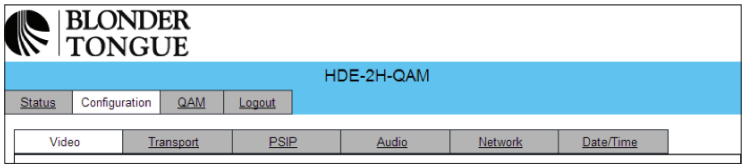


Figure 5-3: Configuration Screen

5.3.1 Configuration > Video

The “Configuration > Video” screen (Figure 5-4) allows you to configure the following parameters for each input:

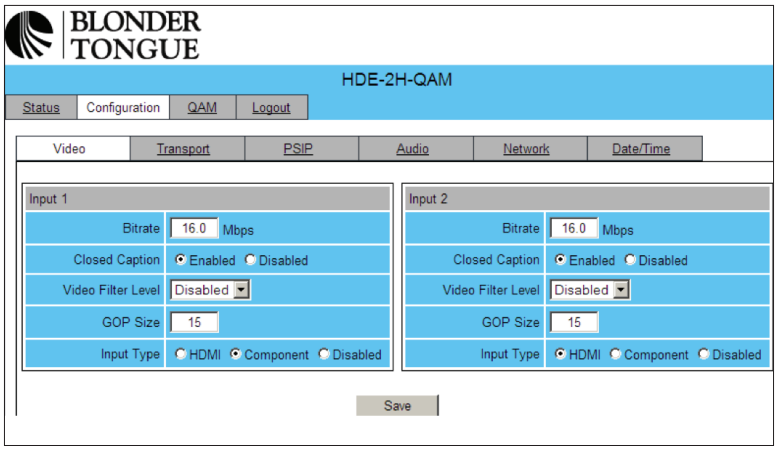


Figure 5-4: Configuration > Video Screen

Bitrate: is the bitrate of the input video and can be adjusted for each input video. Factory default is 16.0 Mbps with 256 output. Although you can assign any bitrate to any input, the sum of both 2 input bitrates must remain less than 38.79 Mbps when selecting QAM 256 modulation, and less than 19.392 Mbps when selecting QAM 64 modulation.

Closed Caption: may be enabled or disabled. Factory default value is "disabled". When closed caption is disabled the unit will not pass the EIA-608 Closed Captioning (CC) information and the CC text will not be displayed on any TV screen. When enabled, however, the CC is passed through the unit and to the TV sets, and will be displayed on the TV set if the TV itself is configured to display the CC text.

Video Filter Level: is a two-dimensional low-pass filter controlling the degree with which the input video is filtered. Four options are available: disable (no filtering), low, medium, and high (highest filtering coefficient). Low-pass filtering of the video will smoothen the sharp edges of the pixels and produce a softer image. The softer an image, the less number of bits required to encode the image at the quantizer level.

GOP Size: (Group of Picture) size is configurable between 1 and 120. The factory default value is 15. This means that the first frame in a GOP will be an I-frame and remaining frames will be P-frames.

Input Type: can be un-encrypted HDMI (HDMI is not applicable to HDE-2C-QAM model), Component, or disabled. Factory default value is HDMI for the HDE-2H-QAM model, and Component for the HDE-2C-QAM model. Select "HDMI" if the input video is HDMI. Select "Component" if the input video is Component (YPbPr). Both inputs, regardless of type, can be disabled.

5.3.2 Configuration > Transport

The “Configuration > Transport” screen (Figure 5-5) allows you to configure the following parameters:

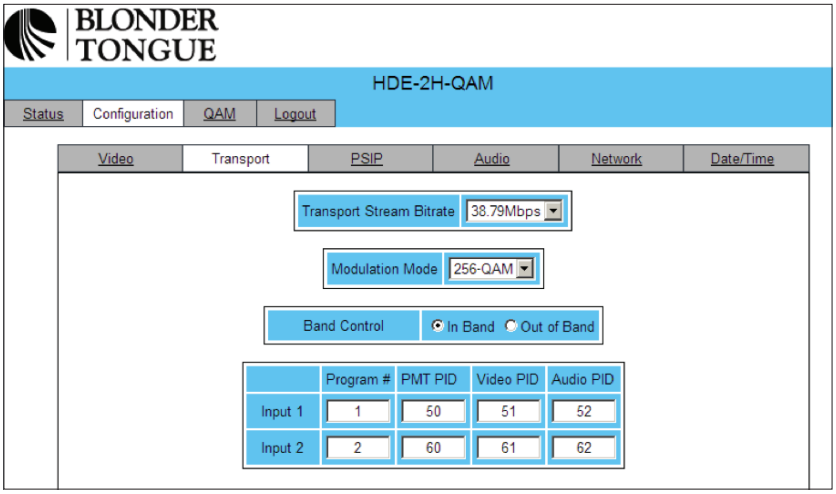


Figure 5-5: Configuration > Transport Screen

Transport Stream Bitrate: can be configured to 38.79 Mbps or 19.39 Mbps. The factory default value is 38.79 Mbps.

Modulation Mode: can be configured for QAM 64 or 256. The factory default value is 256.

Band Control: can be configured to “In Band” or “Out of Band”. The factory default value is “In Band”.

MPEG-2 Transport Stream parameters such as Program Numbers, Video PID (Packet Identifier), Audio PID, and PMT (Program Map Table) PID are also displayed and can be configured. An EIT PID (Event Information Table PID) table is also provided at the bottom of the page. The following limitations apply: Program Number – an integer from 1 to 8191, Any PID Value (PMT, Video or Audio) – an integer from 48 to 8175.

5.3.3 Configuration > PSIP

The Program and System Information Protocol (PSIP) is used in the ATSC digital television system for carrying metadata about each channel in the broadcast transport stream of a TV station and for publishing information about television programs so that viewers can select what to watch by title and description. The “Configuration > PSIP” screen (Figure 5-6) allows you to enter information such as the Transport Stream ID, channel names, and major/minor channel numbers. The following limitations apply:

Transport Stream ID - an integer from 1 to 65535
Channel Name - any ASCII-printable character; 7 characters maximum
Major Channel Number - an integer from 1 to 999
Minor Channel Number - an integer from 0 to 999

Note: If one Minor Channel is configured to 0, then all other Minor Channels must be configured to 0 as well.

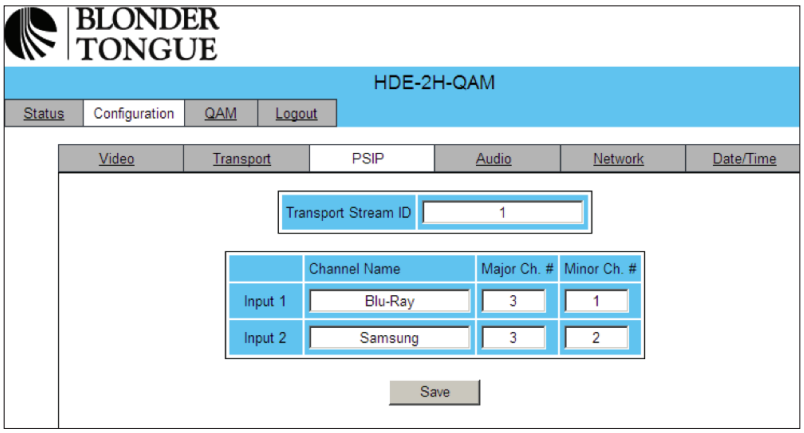


Figure 5-6: Configuration > PSIP Screen

5.3.4 Configuration > Audio

The “Configuration > Audio” screen (Figure 5-7) allows you to configure parameters associated with the Dolby® Digital AC-3 encoded stereo audio. Additional Information on Dolby® Digital AC-3 is provided in Appendix A.

All channels configured with digital inputs must have their respective channel streams configured properly in order to process audio correctly. Typical values are 0 and 1, but this may vary by source. These audio stream configurations are ignored for channels configured for Analog input. "Audio Delay" allows compensation for audio/video skew. The following limitations apply:

Audio Delay - an integer from -300 to 300 (ms).

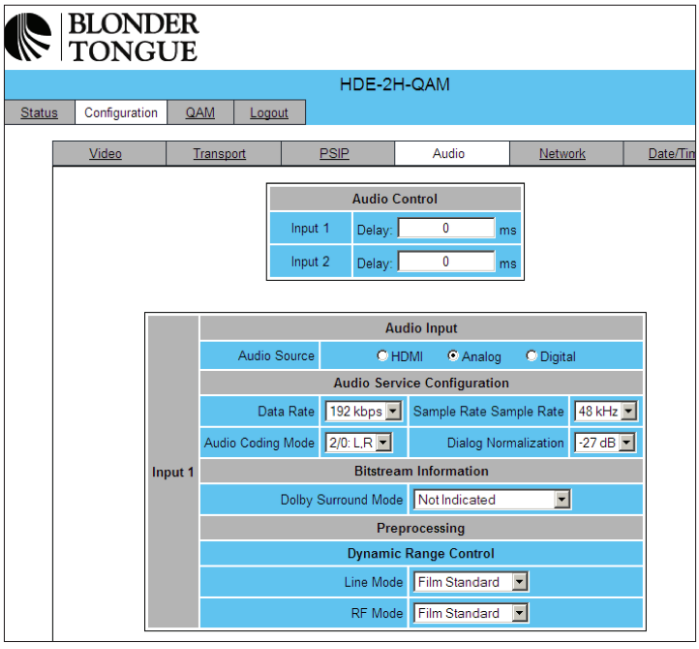


Figure 5-7: Configuration > Audio Control Screen

Audio Source: allows the user to select between three different input Audio sources: HDMI, Analog, or Digital. The default value is HDMI for the HDE-2H-QAM model, and Analog for the HDE-2C-QAM model. HDMI should be selected as the Audio source if using HDMI as the Video source; however, when using Component as the video source, either Analog or Digital can be used as the Audio source.

Data Rate: is the audio data rate in kbps (kilobits per second) and indicates the bitrate allocated for audio encoding. The bitrate can be changed from 96 kbps to 448 kbps. Care must be taken when increasing the audio encoding bitrate to make sure you do not exceed the maximum allowable Transport Bite Rate.

The default value of 192 kbps supports audio encoding 2/0:L,R mode which is the typical configuration for an analog stereo input. If using an source with expanded audio options, the data rate can be increased to accommodate the other audio encoding modes. See Dolby Encoding Guidelines for additional information.

Sample Rate: is the input sampling rate of the encoder. The HDE-2H/C-QAM supports 48 kHz sampling rate.

Audio Coding Mode: also referred to as Channel mode, defines the number of main audio channels within the encoded bitstream and also indicates the channel format. The HDE-2H/C-QAM supports 1/0:C and 2/0:L,R. The default value is 2/0:L,R.

1/0:C = audio is a single or center channel

2/0:L,R= audio is a dual channel (Left & Right)

Dialog Normalization: behaves as an Audio Automatic Gain Control (AGC) or Dynamic Range Control (DRC). It has the ability to take different incoming audio levels and normalize them. The ability of the Dialog Normalization depends on the configuration of the Dynamic Range Control. The HDE-2H/C-QAM allows you to adjust the normalization from -1 to -31 dB. The typical value is -27 dB. This is based on the standard film audio formats which normally are between -25 and -31 dB.

Dolby Surround Mode: inserts information in the digital bitstream to indicate whether the audio is two-channel Dolby or not. The HDE-2H/C-QAM allows you to select between: Not Indicated, Not Dolby Surround encoded, and Dolby Surround encoded. These values are dependent on the Audio coding mode that has been selected.

Not Indicated: the decoder make its own determination of the audio format.

Not Dolby Surround encoded: tells the receiver the audio is not encoded in surround mode.

Dolby Surround encoded: tells the receiver the audio is encoded in surround mode.

Line Mode: is a type of Dynamic Range Compression that is typically applied to signals that will be used as direct audio feeds into a TV tuner or other receive devices.

RF Mode: is a type of Dynamic Range Compression that is typically applied to signals that will be used for retransmission on an RF carrier, and then fed into TV tuner or other receive devices at the end of the line.

There are five different values available for Line and RF:

None, Film Standard, Film Light, Music Standard, Music Light, and Speech.

The default value for both the “Line Mode” and the “RF Mode” are Film Standard. Each of the values have a Null band where the audio levels will be kept between certain range if activated as described below. See Dolby Encoding Guidelines for additional information.

None: No Dynamic range controls have been assigned.

Film Standard: is suitable for movies where the very low-level sounds are not to be amplified due to other undesirable background noises that may become audible, but rather the peaks and valleys are normalized instead. It has a null bandwidth of 10 dB (-31 to -21 dB) and can add up to 6 dB of boast for low levels and attenuate high levels. The setting is used to quiet load shouting and amplifier whispers. See Dolby Encoding Guidelines for additional information.

Film Light: is similar to “Film Standard” but with a null bandwidth of 20 dB (-41 to -21 dB) and can add up to 6 dB of boast for low levels and attenuate high levels.

Music Standard: is suitable for program content that is mainly made up of music where the sound level is to be normalized (reducing the loudness) to be consistent with other programs. It has a null bandwidth of 10 dB (-31 to -21 dB) and can add up to 12 dB of boast for low levels and attenuate high levels. See Dolby Encoding Guidelines for additional information.

Music Light: is similar to “Music Standard” but with a null bandwidth of 20 dB (-41 to -21 dB) and can add up to 12 dB of boast for low levels and attenuate high levels.

Speech: is suitable for program content that is mainly made up of speech only and has a null band width of 10 dB (-31 to -21 dB) for average speech and can add up to 15 dB of boast for low levels and attenuate high levels. The setting is used to quiet load shouting and amplifier whispers. See Dolby Encoding Guidelines for additional information.

5.3.5 Configuration > Network

The “Configuration > Network” screen (Figure 5-8) allows you to change the IP network parameters of the encoder. **A static IP address must be entered.** DHCP is not supported on this unit, so please see your network administrator to get the applicable parameters for your network. The default IP is 172.16.70.1.

Usernames and passwords may also be changed/modified here. The following limitations apply:

IP Address - must conform to the standard network address form and space

Username/Password - any ASCII-printable character

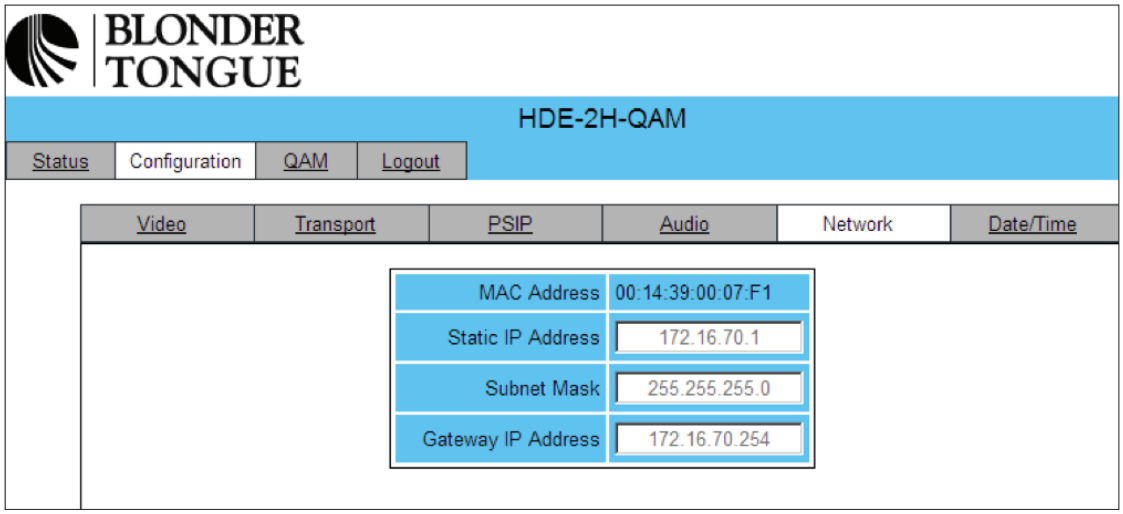


Figure 5-8: Network Screen

HDE-2H/C-QAM supports two levels of access: Administration, and Guest.

Administrators have full read/write authorization in all available screens. Guests have read-only authorization of all available screens, but have limited access to change/modify those configurations.

To change/modify the IP network parameters, as well as the Username and Password values for the unit, you must access a hidden screen by typing the URL of the encoder followed by a forward slash and Admin.htm, for example:

http://172.16.70.1/Admin.htm

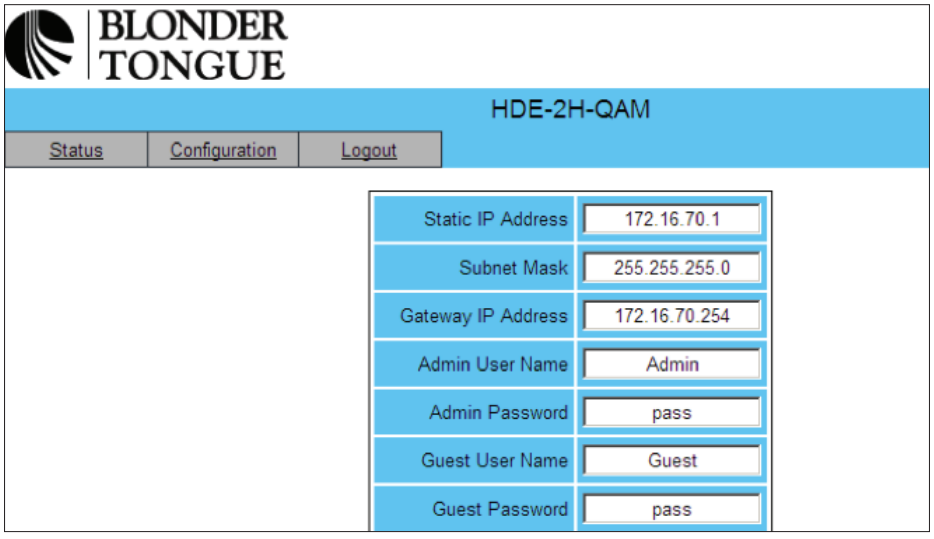


Figure 5-9: The Hidden Network Screen

Administrator can change/modify the following parameters:

Static IP Address: is the IP address that is assigned to the HDE-2H/C-QAM unit. It allows the user to access the unit via the web interface. The factory default IP address is 172.16.70.1.

Subnet Mask: is the Subnet Mask of the HDE-2H/C-QAM unit. It allows the user to access the unit from another network via the web interface. The factory default Subnet Mask is 255.255.255.0

Gateway IP Address: is the default gateway of the HDE-2H/C-QAM unit. It allows the user to access the unit from another network via the web interface. The factory default Subnet Mask is 172.16.70.254.

Admin User Name: is the Administrator login (10 characters maximum). This login allows the user to make changes to any area of the HDE-2H/C-QAM unit. To change the login simply type in the new login and click on the “Save” button located on the bottom of the screen. The factory default Login is “Admin”. Login is case sensitive.

Admin Password: This is the Administrator Password (10 characters maximum). This allows the Admin to access the HDE-2H/C-QAM unit. To change the password simply type in the new password and click on the “Save” button located on the bottom of the screen. The factory default password is “pass”. Password is case sensitive.

Guest User Name: This is the Guest login (10 characters maximum). This login allows the user to view the HDE-2H/C-QAM unit settings but does not allow any changes. To change the Guest login simply type in the new login and click on the “Save” button located on the bottom of the screen. The factory default Guest Login is “Guest”. Login is case sensitive.

Guest Password: The Guest Password (10 characters maximum) allows the guest to access the EQAM unit. To change the Guest password simply type in the new password and click on "Save” button located on the bottom of the screen. The factory default Guest password is “pass”. Password is case sensitive.

5.3.6 Configuration > Date/Time

The “Configuration > Data/Time” screen (Figure 5-10) allows you to set the current date and time for the encoder. To remain compliant with ATSC and cable standards, it is important to have the accurate date and time stamps. For this reason, it is recommended to use the "Automatic" option in "Configuration Method" which allows the encoder to automatically acquire time settings from a "Time Server" - you must enter the IP address of the time server. The time server specified must support the Network Time Protocol (NTP) in order for automatic time acquisition to work properly. If, however, an internet connection is not available, the date and time can be entered manually. The encoder’s current time is displayed for reference. Values shown in Figure 5-10 below are the factory default values.

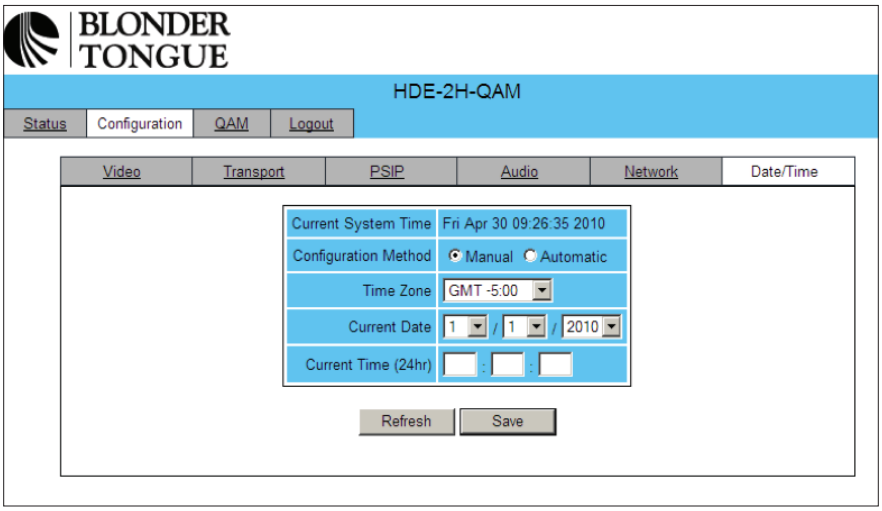


Figure 5-10: Date/Time Manual Screen

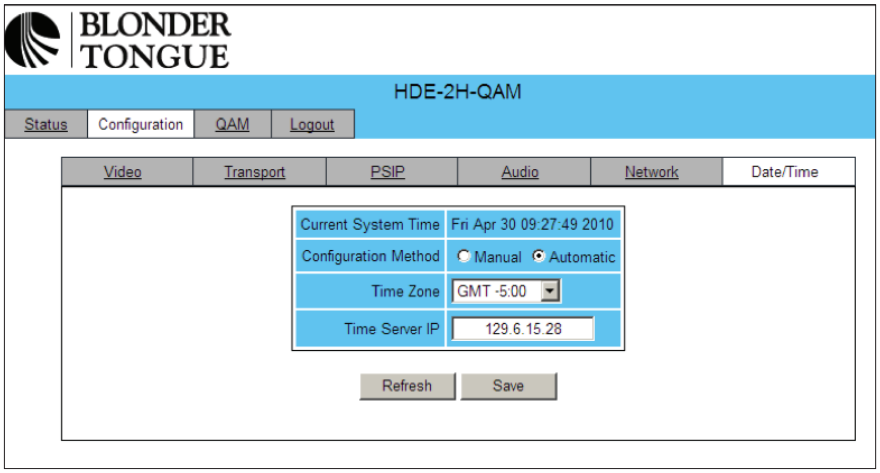


Figure 5-10a: Date/Time Automatic Screen

5.4 QAM

The HDE-2H/C-QAM is equipped with a single QAM output module. The "QAM" screen (Figure 5-11) displays the following information: output Channel Number and Frequency, the Output Control, Output Level in dBmV, Output QAM Mode, Output QAM data rate, QAM Lock status, and the Phase Lock Loop (PLL). To make changes to the QAM values click on the "Edit" button located at the bottom of the screen. This will bring you to the QAM Edit screen. Any time changes are made in this screen you must click on the "Save" button located at the bottom of the screen to save the changes.

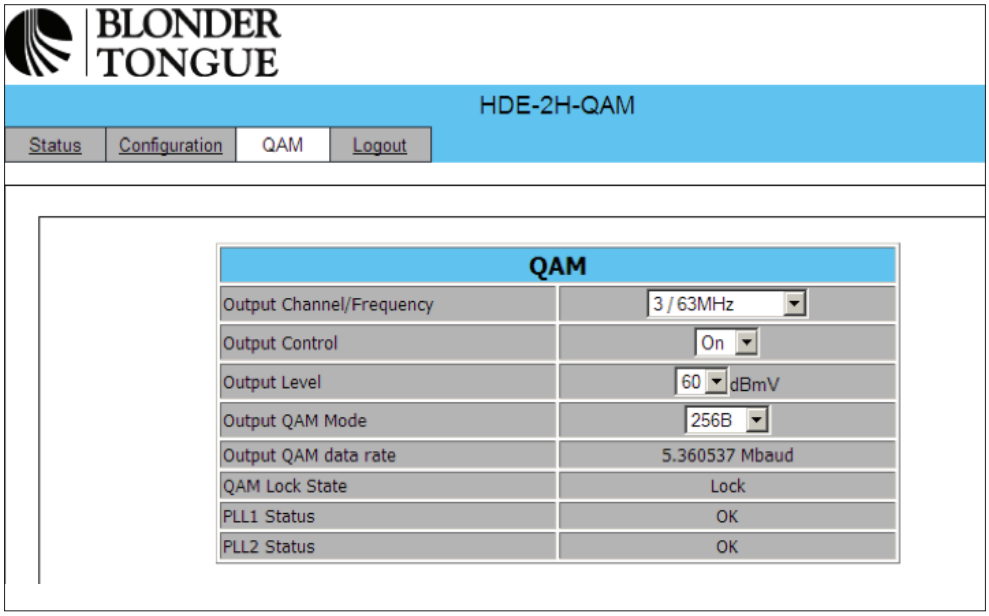


Figure 5-11: QAM Screen

Output Channel/Frequency: indicates the output channel number and channel center frequency of the channel that has been selected. To select a new channel simply click on the pull down menu and highlight the appropriate channel (Sub-band Ch T7 to T14 & CATV Ch 2 to 135 – or 5 to 861 MHz), click on the "Save" button located on the bottom of the screen. Default value is channel 3.

Output Control: allows you to turn each of the individual QAM channels On, Off, or place them in CW mode. To change the QAM mode click on the pull down menu and highlight the appropriate setting (On, Off, CW) then click on the "Save" button located on the bottom of the screen. CW mode activates an analog carrier at center frequency; this mode is used to help in the alignment of the RF system. Default value is "ON".

Output Level: allows you to adjust the QAM RF output level for a given channel. To change the QAM output level click on the pull down menu and highlight the appropriate RF level setting (55 to 62 dBmV) then click on the "Save" button located on the bottom of the screen. Default setting is "60 dBmV".

Output QAM Mode: allows you to select the QAM RF output mode settings for a given channel. To change the QAM output mode click on the pull down menu and highlight the appropriate setting (64B, 256B, 64A, 128A, 256A, 512A, 1024A) then click on the "Save" button located on the bottom of the screen. In 256B mode (QAM 256, ITU Annex B) the maximum allowed transport bitrate for all the multiplexed input programs is 38.8 Mbps. In 64B mode (QAM 64, ITU Annex B) that limit is 26.9 Mbps. Default setting is "256B".

Output QAM data rate: a read-only parameter that indicates the maximum data rate depending on the selected QAM mode (64B – 5.056900 Mbaud, 256B – 5.360537 Mbuad).

QAM Lock status: a read-only value. Locked indicates that the QAM module is working properly. Unlocked indicates that there is a problem with the QAM module. Module may take a few seconds to lock after changing channels on the module.

PLL 1 & 2 status: a read-only parameter that indicates the status of the PLL (Phase lock loop) circuits for each of the QAM RF output channels with in a given QAM module. Status should read OK.

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Appendix A: Dolby® Digital (AC-3)

Special Note on the Use of Dolby Trademarks

Dolby Laboratories encourages use of Dolby trademarks to identify sound tracks that are encoded with Dolby technologies. This is an effective way to inform listeners of the soundtrack format, and the use of a standard logo promotes easy recognition in the marketplace. However, as with all trademarks, Dolby trademarks may not be used without permission. Dolby Laboratories therefore provides a trademark agreement for companies that wish to use Dolby trademarks.

This agreement should be signed by the company that owns the program material being produced. Recording studios or production facilities that provide only audio production or encoding services for outside clients generally do not require a trademark license. If you would like more information on obtaining a Dolby trademark license, please contact Dolby Laboratories Licensing Corporation, or visit the Other Encoded Content portion of the Licensing and Trademark section of www.dolby.com.

Dolby® Digital (AC-3) requires that every decoder implement Dynamic Range Control (DRC). This allows the program producer to exercise control over the kind of audio compression applied within the consumer's decoder. Depending upon the device and output used, the consumer may also have control over the amount of compression applied. All this happens in the decoder after any dialnorm gain reduction has been applied.

Consumer RF Modulator

If the consumer device includes an RF modulator, Dolby® requires the decoder feeding it to use whatever compression profile has been assigned to the "RF Mode" within the encoder. The level of the signal is also raised 11 dB and peaks are limited. If Dialnorm was set correctly, dialog will be raised to a level of -20 dBFS, leaving headroom of 20 dB.

Consumer Stereo Output

For these outputs, Dolby® requires that consumer device offer compression that has been applied within the encoder to the "Line Mode". The consumer device may also optionally offer a switch for the "RF Mode" compression if the user desires less dynamic range. The device may allow scaling of the low level boost compression, but does not allow scaling of the high-level gain reduction.

Consumer 5.1 Surround Output

Devices with these outputs can, and often do, provide the consumer with a choice of compression: Line Mode ("Light"), RF Mode ("Heavy") or None. Some devices also provide a range of choices, scaling between "Line Mode" and no compression.

Encoder Compression Profiles

For both "Line Mode" and "RF Mode" compression, every Dolby® Digital encoder offers the choice of six different compression "profiles" as defined by Dolby®:

None: No dynamic range compression is applied unless down mixing could cause overload, in which case protection [compression] is automatically applied.

Speech: Appropriate for programs with predominantly dialogue.

Music Light: Applies light compression to music that is already compressed and does not require excessive dynamic range restriction.

Music Standard: Applies more compression to music that is not compressed and requires dynamic range restriction.

Film Light: Applies light compression to a subjectively quiet film that does not require excessive dynamic range restriction.

Film Standard: Applies more compression to a subjectively loud film that requires dynamic range restriction.

More information on these profiles can be obtained by visiting

http://www.dolby.com/professional/pro_audio_engineering/dp569_01.html.

A.1 Implications

If a broadcaster chooses "none" for both "line mode" and "RF mode" within their encoder, DRC will be deactivated for all consumers. While DRC is not a multiband processor and may be more audible than a multiband broadcast limiter, it seems logical to use minimal compression prior to the Dolby® Digital system and enable moderate DRC for "line mode" and more aggressive DRC for "RF mode". This will provide the consumer with convenient automatic and manual control over the amount of compression used.

A.2 Dialnorm

The purpose of dialnorm (dialog normalization) is to maintain a consistent dialog level for the listener. Dolby® Laboratories requires dialnorm implementation in every Dolby® Digital encoder and decoder.

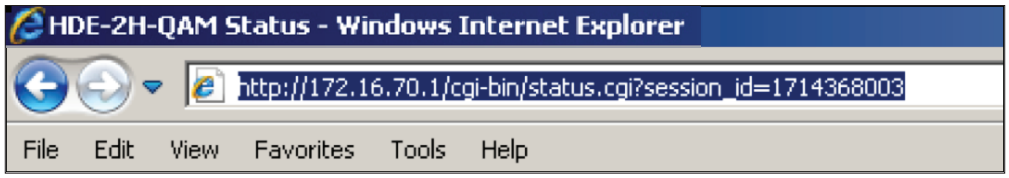
The dialnorm metadata parameter is set in the encoder, and ranges from -31 to -1. If dialnorm is increased from -31 to -1, the decoder reduces the audio level by an equal number of decibels.

Dolby® suggests setting this parameter equal to the encoder digital input average A-weighted dialog level unique to each show. They also recognize that it may be simpler to fix dialnorm at a setting appropriate to archives, and adjust the audio mix of new productions to match. This eliminates the need to implement a complex metadata system.

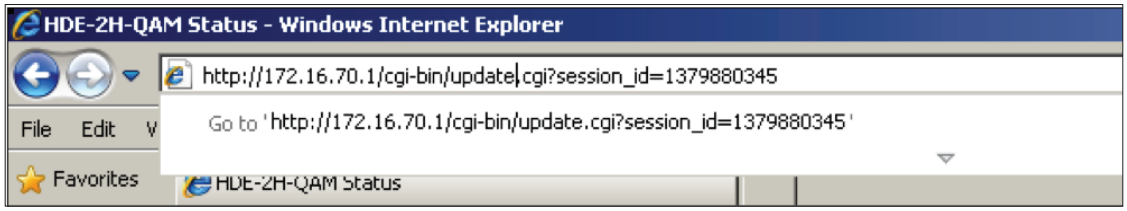
Appendix B: Software Upgrade Procedure

[1] Contact Blonder Tongue's Systems Engineering Department (1-800-523-6049 ext. 4217, 732-679-4000 ext. 4217) to get the information on the FTP site from where you can download the new software.

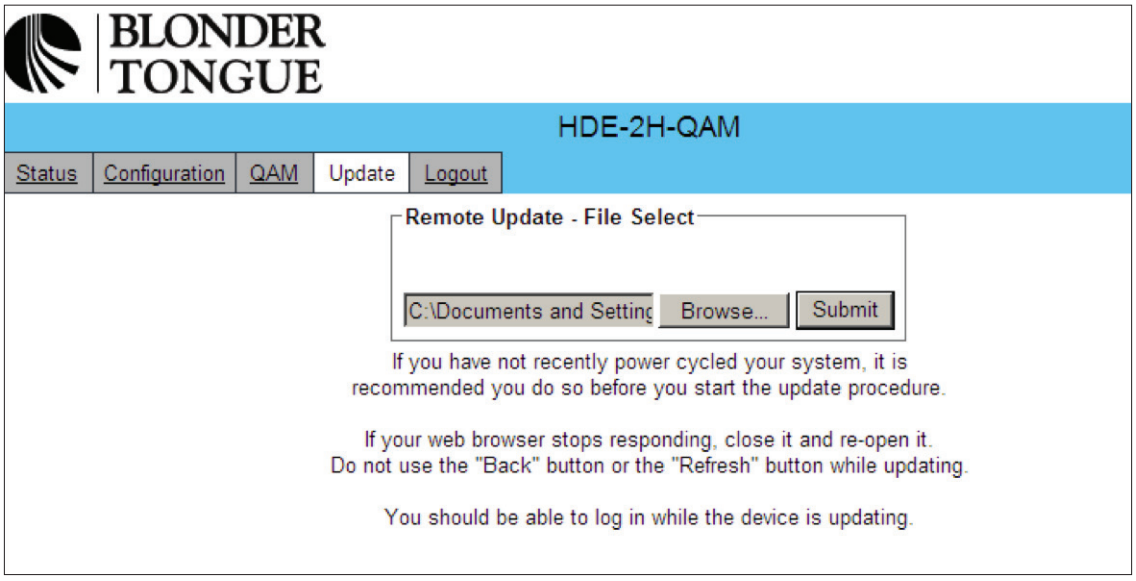
[2] Log-on to your encoder (HDE-ASI or SD4E-ASI) by using the IP address you have assigned to it or the factory default IP address (712.16.70.1). A "status" URL similar to the one shown below will appear:



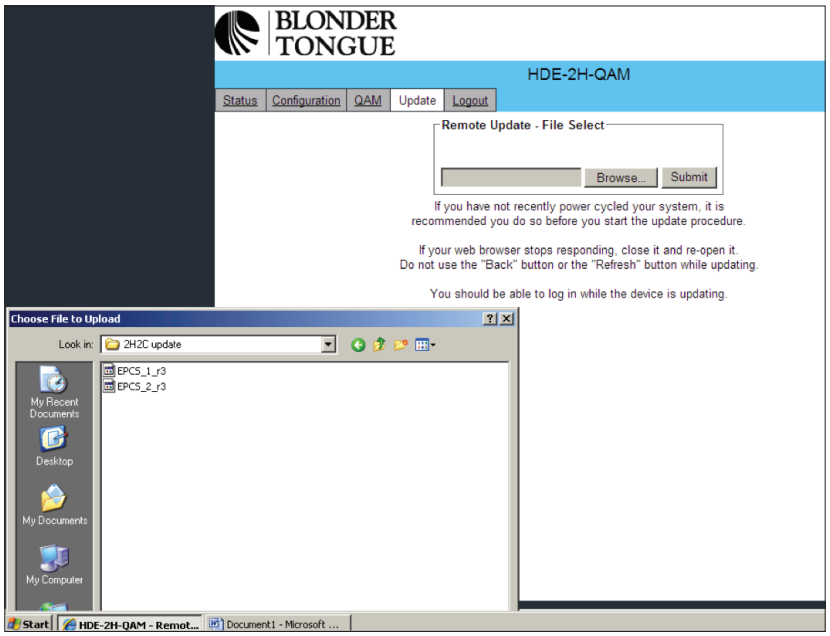
[3] Change the URL by replacing the word "status" with the word "update". Do not change or remove the "session_id". Therefore, for the example above, the revised URL should be:



[4] This will bring you to the "Remote Update" screen shown below. Read the instructions on the web-page and follow them exactly. The update process can take as long as 30 minutes for both FPGA chip-sets of the unit.



[4] Click on the “Browse” button and locate the files provided by Blonder Tongue’s Systems Engineering Department. The BIN files will be labeled EPCS_x_x_rxx.bin, as shown in the example below, where "x" can be a letter or a number.

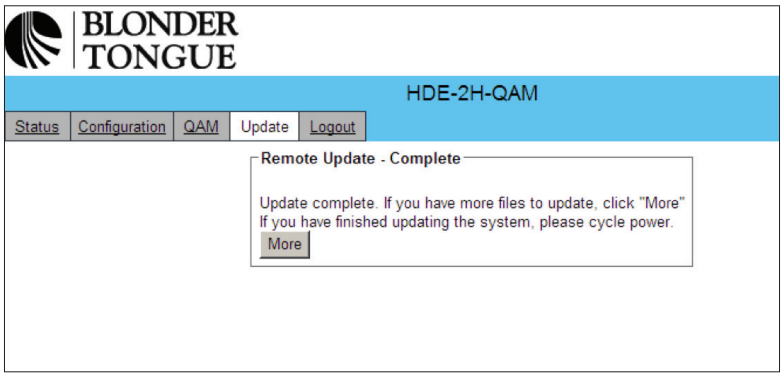


There are two “.bin” files for the two FPGAs that need to be upgraded. Only one FPGA can be upgraded at a time. Upload the Bin file for FPGA#2 first.

Once the file for FPGA#2 has been located (EPCS_2_bt_r19.bin in the example above), select it by highlighting it and then click on “Submit” button to start the upgrade process.

The upgrade consists of four stages (File Upload, Formatting Uploaded File, Flashing Device, and Verifying Files) which will be displayed on the screen to indicate progress at each stage. Be patient and allow the upgrade to be completed without interruption.

[5] Once the upgrade of FPGA#2 is completed, the following screen will appear:



Click on the “More” button and repeat the procedure to upgrade FPGA#1.

[6] Power cycle the unit after both FPGAs have been upgraded.

[7] Congratulations – you have completed the upgrade process. Log-on to the unit and verify the new software version on the “Status” screen.

Glossary

AES: Audio Engineering Society, Organization responsible for many standards used within the audio, video DVD and broadcast industries. www.aes.org

ASI: Asynchronous Serial Interface.

BITRATE: The amount of data being transported, measured relative to quantity over time in bits per second (thousand bits per second or kb/s, million bits per second or MB/s, billion bits per second or GB/s and trillion bits per second or TB/s).

DVI: Digital Visual Interface.

EIT PID: Event information table; the EIT is part of the DVB standard and provides schedule information for digital programming.

GOP SIZE: The GOP size determines total number of frames in the GOP (Group of Pictures). Current GOP sizes are for example 15.

NTSC: National Television Standards Committee. Video standard established by the United States (RCA/NBC) and adopted by numerous other countries: 525-line video with 3.58-MHz chroma subcarrier and 60 cycles per second.

PMT ID: Program Map Tables (PMTs) contain information about programs. For each program, there is one PMT. Each PMT shall be transmitted on a separate PID although technically it is not required. The PMTs describe which PIDs contain data relevant to the programs. PMTs also provide metadata about the streams in their constituent PIDs. For example, if a program contains an MPEG-2 video stream, the PMT will list this PID, describe it as a video stream, and provide the type of video that it contains. The PMT may also contain additional descriptors providing data about its constituent streams.

PSIP: Program and System Information Protocol. This is the digital information transmitted by a DTV station that includes the time and date, major and minor channel numbers, and program information.

SDI: The professional digital video connection format using a 270 Mbps transfer rate. A 10-bit, scrambled, polarity-independent interface, with common scrambling for both component ITU-R 601 and composite digital video and four groups each of four channels of embedded digital audio. SDI uses standard 75-ohm BNC connectors and coax cable.

SMPTE: The Society of Motion Picture and Television Engineers: An international research and standards organization. The SMPTE time code, used for marking the position of audio or video in time, was developed by this group.

Notes

Limited Warranty

Blonder Tongue Laboratories, Inc. (BT) will at its sole option, either repair or replace (with a new or factory reconditioned product, as BT may determine) any product manufactured by BT which proves to be defective in materials or workmanship or fails to meet the specifications which are in effect on the date of shipment or such other specifications as may have been expressly agreed upon in writing (i) for a period of one (1) year from the date of original purchase (or such shorter period of time as may be set forth in the license agreement specific to the particular software being licensed), with respect to iCentral™ (hardware and software) and all other software products (including embedded software) licensed from BT, (ii)) for a period of one (1) year from the date of original purchase, with respect to all MegaPort™, IPTV products, and fiber optics receivers, transmitters, couplers and integrated receiver/distribution amplifiers (including TRAILBLAZER™, RETRO-LINX™ and TWIN STAR™ products) as well as for DigiCipher ® satellite receivers, and (iii) for a period of three (3) years from the date of original purchase, with respect to all other BT products. Notwithstanding the foregoing, in some cases, the warranty on certain proprietary sub-assembly modules manufactured by third-party vendors and contained in BT products and on certain private–label products manufactured by third-parties for resale by BT are of shorter duration or otherwise more limited than the standard BT limited warranty. In such cases, BT's warranty with respect to such third-party proprietary sub-assembly modules and private-label products will be limited to the duration and other terms of such third-party vendor's warranty. In addition, certain products, that are not manufactured but are resold by BT, carry the original OEM warranty for such products. The limited warranty set forth in this paragraph does not apply to any product sold by BT, which at the time of sale constituted a Refurbished/Closeout Product.

(b) BT will at its sole option, either repair or replace (with a new or factory-reconditioned product, as BT may determine) any product sold by BT which at the time of sale constituted a refurbished or closeout item ("Refurbished/Closeout Product"), which proves to be defective in materials or workmanship or fails to meet the specifications which are in effect on the date of shipment or such other specifications as may have been expressly agreed upon in writing, for a period of ninety (90) days from the date of original purchase. Notwithstanding the foregoing, in some cases the warranty on third party software and on certain proprietary sub-assembly modules manufactured by third-party vendors and contained in BT products and on certain private–label products manufactured by third-parties for resale by BT are of shorter duration or otherwise more limited than the BT limited warranty for Refurbished/Closeout Products. In such cases, BT's warranty for Refurbished/Closeout Products constituting such third party software, third-party proprietary sub-assembly modules and private-label products will be limited to the duration and other terms of such third-party vendor's warranty. In addition, notwithstanding the foregoing, (i) certain Refurbished/Closeout Products that are not manufactured (but are resold) by BT, carry the original OEM warranty for such products, which may be longer or shorter than the BT limited warranty for Refurbished/Closeout Products. All sales of Refurbished/Closeout Products are final.

To obtain service under this warranty, the defective product, together with a copy of the sales receipt or other satisfactory proof of purchase and a brief description of the defect, must be shipped freight prepaid to: Blonder Tongue Laboratories, Inc., One Jake Brown Road, Old Bridge, New Jersey 08857.

This warranty does not cover damage resulting from (i) use or installation other than in strict accordance with manufacturer's written instructions, (ii) disassembly or repair by someone other than the manufacturer or a manufacturer-authorized repair center, (iii) misuse, misapplication or abuse, (iv) alteration, (v) lack of reasonable care or (vi) wind, ice, snow, rain, lightning, or any other weather conditions or acts of God.

OTHER THAN THE WARRANTIES SET FORTH ABOVE, BT MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND, EXPRESS OR IMPLIED, AS TO THE CONDITION, DESCRIPTION, FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR AS TO ANY OTHER MATTER, AND SUCH WARRANTIES SUPERSEDE ANY ORAL OR WRITTEN WARRANTIES OR REPRESENTATIONS MADE OR IMPLIED BY BT OR BY ANY OF BT'S EMPLOYEES OR REPRESENTATIVES, OR IN ANY OF BT'S BROCHURES MANUALS, CATALOGS, LITERATURE OR OTHER MATERIALS. IN ALL CASES, BUYER'S SOLE AND EXCLUSIVE REMEDY AND BT'S SOLE OBLIGATION FOR ANY BREACH OF THE WARRANTIES CONTAINED HEREIN SHALL BE LIMITED TO THE REPAIR OR REPLACEMENT OF THE DEFECTIVE PRODUCT F.O.B. SHIPPING POINT, AS BT IN ITS SOLE DISCRETION SHALL DETERMINE. BT SHALL IN NO EVENT AND UNDER NO CIRCUMSTANCES BE LIABLE OR RESPONSIBLE FOR ANY CONSEQUENTIAL, INDIRECT, INCIDENTAL, PUNITIVE, DIRECT OR SPECIAL DAMAGES BASED UPON BREACH OF WARRANTY, BREACH OF CONTRACT, NEGLIGENCE, STRICT TORT LIABILITY OR OTHERWISE OR ANY OTHER LEGAL THEORY, ARISING DIRECTLY OR INDIRECTLY FROM THE SALE, USE, INSTALLATION OR FAILURE OF ANY PRODUCT ACQUIRED BY BUYER FROM BT.

All claims for shortages, defects, and non-conforming goods must be made by the customer in writing within five (5) days of receipt of merchandise, which writing shall state with particularity all material facts concerning the claim then known to the customer. Upon any such claim, the customer shall hold the goods complained of intact and duly protected, for a period of up to sixty (60) days. Upon the request of BT, the customer shall ship such allegedly non-conforming or defective goods, freight prepaid to BT for examination by BT's inspection department and verification of the defect. BT, at its option, will either repair, replace or issue a credit for products determined to be defective. BT's liability and responsibility for defective products is specifically limited to the defective item or to credit towards the original billing. All such replacements by BT shall be made free of charge f.o.b. the delivery point called for in the original order. Products for which replacement has been made under the provisions of this clause shall become the property of BT. Under no circumstances are products to be returned to BT without BT's prior written authorization. BT reserves the right to scrap any unauthorized returns on a no-credit basis. Any actions for breach of a contract of sale between BT and a customer must be commenced by the customer within thirteen (13) months after the cause of action has accrued. A copy of BT's standard terms and conditions of sale, including the limited warranty, is available from BT upon request. Copies of the limited warranties covering third-party proprietary sub-assembly modules and private-label products manufactured by third-parties are also available from BT on request. DigiCipher ® is a registered trademark of Motorola Corp. (**Rev 0509)**

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